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ORIGINAL ARTICLE

Antiviral activity of *Phoenix dactylifera* extracts against herpes simplex virus type 1: an animal study

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Abstract

Herbal medicines have recently been developed for the treatment of infectious diseases. The aim of this study was to investigate the therapeutic potential of *Phoenix dactylifera* fruit and kernel extracts against herpes simplex virus type 1 (HSV-1) in an animal model. Five, 10, and 15% (w/w) concentrations of aqueous, ethanol, and acetone extracts of kernel and fruit of *Phoenix dactylifera* were used for the formulation of cream-based drugs for the treatment of HSV-1-infected mice. The clinical improvement was evaluated using lesion scoring and histopathological assessments. Our results demonstrated that there is a potent antiviral activity associated with *Phoenix dactylifera* extract against HSV-1 infections. Treatment with cream containing 5% *Phoenix dactylifera* kernel ethanol extract was observed as the most efficient therapeutic potential to treat HSV-1-infected mice. Lesion scoring assessment and histopathological analysis showed more effective and faster antiviral activity of this treatment than other extracts and concentrations in comparison with the acyclovir, as the reference drug, for the treatment of HSV-1 infections. These findings suggest that *Phoenix dactylifera* extract may be considered as an alternative to acyclovir and potential phototherapeutic against HSV-1 diseases; however, randomized clinical trial studies are strongly needed to ensure the quality, safety, and efficacy of the drug.

Keywords HSV type 1 · *Phoenix dactylifera* · Animal study · Antiviral activity

Introduction

Herpes simplex virus (HSV), a member of the *Herpesviridae* family, cause a range of in human and animals which are partly life-threatening. Two types of HSV are common in human infections considered a significant public health concern. The potential of primary infection was seen in persons who have not been infected by HSV types 1 or 2 previously (Birkmann and Zimmermann 2016). In maximum cases reported for this disease, clinically symptoms are ranged from mild pharyngitis to severe illnesses and occasionally death. HSV-1 is more common in children and frequently cause oral infections; however, most infected cases with genital herpes were caused by HSV-2. Pharyngitis, conjunctivitis, skin vesicular eruption, and keratitis usually occurred in adolescents and adults by primary HSV-1 infection (Hu et al. 2016).

There are many antiviral drugs based on chemical and medicinal plants for the treatment of HSV infection. Acyclovir is the standard treatment as a typical chemical-based

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